MATERIALS SCIENCE &
INSTITUTE for THEORETICAL SCIENCES
COLLOQUIUM

SPEAKER: Professor Imre Kondor
Collegium Budapest
Institute for Advanced Study

TITLE: Measurement noise and portfolios: Application of statistical physics methods in portfolio selection

DATE: Thursday, August 11, 2005

TIME: 11:00 a.m.

PLACE: Building 212, Room A157

HOST: Suzanne te Velthuis

Refreshments will be served at 10:45 a.m.

Abstract: The talk reviews various aspects of the portfolio selection problem. Within the usual mean-variance framework we investigate the effect of noise due to the finite length of the time series, and develop a model (simulation)-based method for the systematic assessment of the different noise-reduction techniques existing in the literature. These include the random matrix theory-based filtering technique which we find to perform consistently well. Going beyond variance as risk measure, we also study non-stationary (IGARCH-like) models, and derive the spectrum of random covariance matrices for exponentially weighted time series. Extending the framework still in another direction, we study the effect of noise on portfolio selection under various alternative risk measures (absolute deviation, expected shortfall, and worst loss), and find an enhanced sensitivity to noise in all these cases. In addition, for expected shortfall and extreme loss the solvability of the optimization problem becomes a probabilistic issue, and we study the relevant distributions both by analytic and numerical methods.